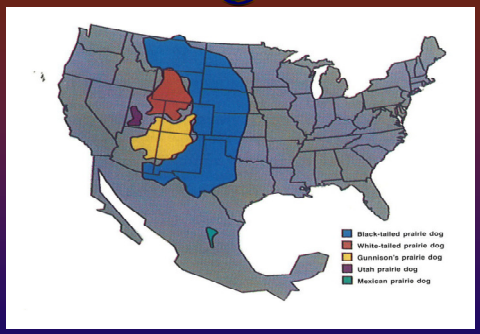
The Utah Prairie Dog

Cynomys parvidens

Life History and Ecology of a Threatened Species

The Utah Prairie Dog

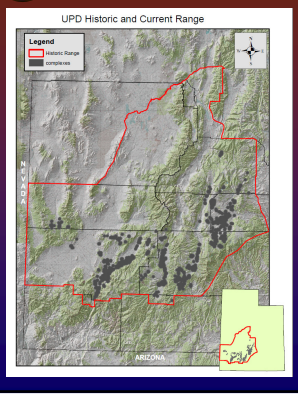
- Order - Rodentia
- Family – Sciuridae
- Genus - Cynomys
- 5 species of prairie dogs in N. America: Black Tailed, Mexican, Gunnison's, White-tailed and Utah
- Some evidence suggests that Gunnison's PD are the ancestral species - closest to ground squirrels
- UPD is the western-most and most isolated member of the Genus
- Allopatric speciation - UPD pushed further west, as Pleistocene ended, they receded east with the drying landscape (Great Basin)



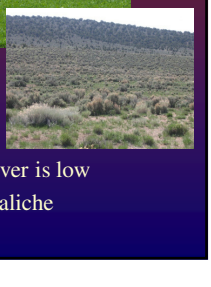
Geographic ranges of the five prairie dog species in N. America

Distribution

- Entire Species ranges over 8 counties in SW Utah
- Elevations from 5,000 ft to almost 10,000 ft
- Primarily in valleys, but also some mountain plateaus
- Can live in association with humans – agriculture, urban and suburban areas

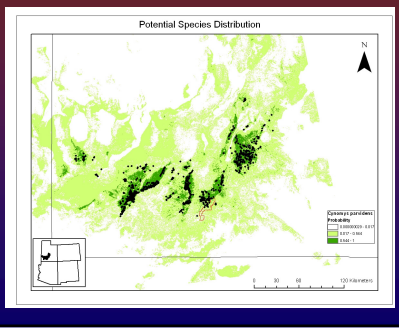


Habitat



- Rangeland
- Grassland
- Shrub-steppe
- Meadow
- Edge of Ponderosa stands
- Typically not in PJ
- Can be in sagebrush, when canopy cover is low
- Prefer well drained soils, don't like Caliche

Habitat Potential (D. Ikeda-NAU)

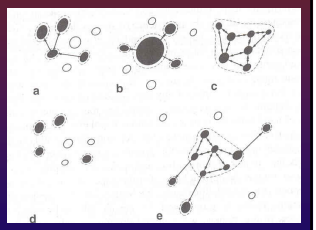


Population Structure

- Social, fossorial mammal
- Coterie (family group) consists of one adult male (invests nothing in parental care), one to three adult females, sub-adults, and juveniles
- Colony – a group of related coteries
- Complex – all colonies within 2 miles of one another
- Population trends are driven by metapopulation dynamics

Population Structure (cont.)

- Metapopulation Dynamics
  - Populations are spatially structured into assemblages of local breeding populations
  - Migration has some effect on local dynamics, including the possibility of population reestablishment following extinction (Hanski & Simberloff)
  - Long term persistence of a metapopulation depends on the balance between extinction and recolonization of habitat fragment
- Colonization/Extinction>1



Life History

- Hibernation/Aestivation – late summer through winter; differences by age and sex
- Females come into estrous for only 1 day a year soon after emerging in the spring, usually in late March or early April; there is some multiple paternity; 82% of copulating females gave birth
- Gestation - 35 days
- Litter size 1-8 (average ~ 4)
- Juveniles emerge several weeks after birth, normally mid-May to mid-June
- High Summer production (colony can triple-quadruple in size)
- Diet consists of grasses, shrubs, forbs, and insects

Life History (cont.)

- Burrows usually have at least two entrances; older mounds may have multiple entrances
- Burrows are 5-10 m long, 2-3 m deep
- High colony & burrow system affinity
- Dispersal does occur (recall metapopulation dynamics), but is not well understood; distances to 6 km have been documented
- Diurnal , but spend ~ 50% of the time underground; they will enter aestivation during drought, high temps
- Predators - coyote, badger, raptors, weasel, foxes, bobcat, etc. (it's a drag to be at the bottom of the food chain!) – hence the importance of the burrow system
- Juvenile mortality is high; overwinter mortality is 60-80%

Behavior:

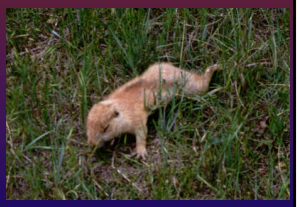
- Vigilance - predator scanning and anti predator calls
- There is some evidence in Black-tailed PD of variation in anti-predator calling - work in other sciurids – demonstrate - different calls for different predators, and different calls for the same predator - diff. condition of predator-urgency levels - coyote trotting v. charging
- Communal nursing - close kin
- Kissing, grooming
- Infanticide
- Cannibalism
- Fighting-male /male competition

Reasons for Listing

- Dramatically reduced distribution by 1960's
- Turner (1979) estimated 95, 000 UPD in Southwest Utah in 1920's
- Collier and Spillett (1972) estimated less than 3,300 UPD remaining and predicted extinction by 2000
- About 6,000 today (adult spring count)
- Factors - considered an agricultural pest, government sponsored "intensive control" campaigns (poisoning, shooting), disease (sylvatic plague), and anthropogenic habitat loss and fragmentation
- Similar situation with other PD species

Plague

- Sylvatic plague *(Yersinia pestis)* - can cause colony wide extinctions
- Brought to N. American c.1899 by shipboard rats, probably through San Francisco
- Reached Utah in the early 1930's
- Vector is a flea
- Control efforts - plague vaccine, Deltamethrin -



Sick dog- potential plague victim, found near plague outbreak near Ft. Collins, CO

Lead Poisoning

- Stress hormones
- Local extinction
- Let us know

Why care about prairie dogs?

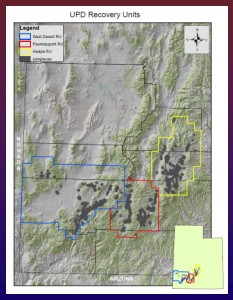
- Some work supporting idea that prairie dogs are an important "keystone" species in prairie ecosystems
- Keystone species – a species that, despite low biomass exert strong effects on the structure of the community they inhabit (Molles 1999)
- Burrow systems provide habitat for a wide range of species, and prairie dogs themselves are an important prey species
- Preserving biodiversity
- Work shows that bison and other ungulates (livestock) may actually preferentially graze around/near prairie dog towns - inc. plant diversity on/near PD towns

What action has been taken?

- Classified as an endangered species 6/4/1973
- Due to population growth of private land- declassified to threatened 5/29/1984
- Official recovery plan- approved by U.S. Fish and Wildlife Service –1991, New Plan in review- emphasize private lands as well, suggests 1000 counted dogs on each R.A. (yields effective population of 500 individuals in each R.A.)
- Since 1972- UDWR has implemented a translocation program- moving prairie dogs from private land to areas of "historical occupancy" on public lands
- Recovery efforts occur in 3 recovery areas

Recovery Units

- 3 recovery units have been identified West Desert, Paunsaugunt, and the Awapa Plateau
- West Desert = 5,000 - 6,000ft
- Paunsaugunt = 6,000 - 8,000ft
- Awapa = 7,000 - 10,000 feet



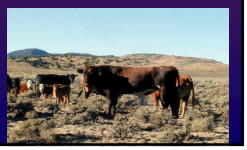
Translocation Program

- Translocation regime- from 1972-2008- UDWR over 23K UPD have been moved from private to public land
- Some success- new colonies/complexes
- On private land- resources may be better- however it is much more difficult for laws to be enforced and the population to be efficiently managed
- Research – concerning release regimes-
- Burrow types (artificial), different types of materials used
- Temporal variation in release group types- e.g.- males first, then juvenile and young
- Different treatments at release sites- seeded, unseeded, grazed, ungrazed
- Predator trapping at site before release
- Habitat research at potential transplant sites (ungulate usage, veg diversity)

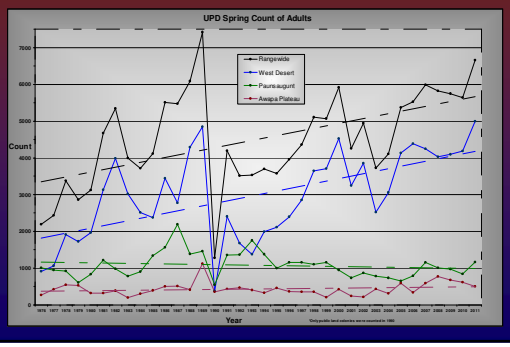
Habitat research at potential transplant site- Awapa Plateau near Loa, UT

Where to put them?

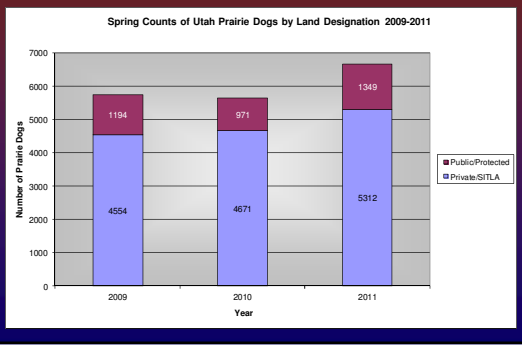
- Public land- multiple parties have interest in usage of public land- which is controlled by multiple agencies (US. Forest Service, BLM, State of Utah, National Park Service)
- Ranchers- sheep, cows
- ATV enthusiasts, hunters, outdoor sports
- Conservationists
- This creates tension during translocation program
- Need to find conservation solutions that balance all interests
- PD and cattle can get along



Population Trend 1979 - 2011



Private/Public Distribution



4D rule

- Allows for "take" of UPD's to ameliorate impacts on agriculture
- NOT designed to eliminate colony, only to cull summertime production
- 40%-50% reported "take" rate

Current Efforts

- Safe Harbors
- UPD Habitat Credit and Exchange Program
- UPDRIP
- Recovery Team
- Ongoing research
- Range wide HCP